

## ***Crossing the Digital Divide (v87)***

“Choice”

By Joseph Feigon

For the Observer

I was in San Francisco on business earlier this week. At roughly 10am on Monday morning, Comcast had some sort of network outage, impacting services to thousands of customers. They weren't answering phone calls.

I run several servers 24 hours a day; without Internet service, those machines can't do their job. I am reliant on ONE carrier for service to my office, however, I strive to practice what I preach. My critical files are replicated elsewhere every night. I use IMAP for my email. I have a SIP based phone system.

I can access my email and most of my files from my smartphone. While Comcast was fixing their problem, I was still able to work, albeit, some applications were stalled until service was restored.

The Internet loosely runs on a 7-Layer OSI (Open Systems Interconnection) model, where each layer has a specialized job.

- (1) Physical Layer. This is the copper or fiber optic media that connects devices.
- (2) Data Link Layer. This provides node-to-node communications.
  - Layer 1 & 2 are generally physical (wireless is virtually real)
- (3) Network Layer.
- (4) Transport Layer.
  - Network and Transport is the core function of the Internet
- (5) Session Layer.
- (6) Presentation Layer.
  - These two layers receive little focus
- (7) Application Layer.
  - Layer 7 is where it all comes together. Email happens at this layer, as do phone calls. Retail and wholesale business lives in Layer 7. Government, Education, Medical all rely upon Layer 7. The Finance industry is helpless without the Internet.

The OSI Model isn't rigid, there are far more exceptions than examples of an end-to-end solution that follows the model to the letter. The Internet was engineered for flexibility, scalability, survivability. Better software and applications take advantage of the OSI model to minimize errors and maximize communications connections. Smarter application providers pay attention to all layers of the model, time is money, resources are money, move it faster, cheaper, and smaller, time and resources are

saved, ultimately costing less. The data will take care of itself (in most cases) if a packet of information is out-of-sequence or lost, but if there's no physical connection, and no power, the model breaks. This is one of the reasons we seek resiliency in our networks, and choose service providers who understand that no one carrier is without service interruptions, and use multiple providers to minimize risk, downtime, and potential loss of information/revenue.

'Google' OSI, or visit Wikipedia and read about OSI. The Internet is dependent on the OSI model, as its (the Internet) very existence requires physical media and power. You will be hard pressed to find any corporation listed as sole provider to any of the lower layers of the OSI Model (physical connections and a data stream), although market domination or lack of market density may make it seem that there's only one provider.

I haven't lost track of my point this week - my "business" doesn't depend upon one Internet Service Provider, but if it did, I'd seek out a provider who plans for outages by design, and employs more than one carrier, so that, when something breaks upstream, it doesn't break for everyone downstream.

Control those things you can, and keep the surprises to a minimum!